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EXAMINER

BAREFORD, KATHERINE A

ART UNIT

PAPER NUMBER

1762

DATE MAILED: 06/06/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/914,657

Applicant(s)

MAENPAA ET AL

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 14-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

claims 1-13 are canceled.

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/24/01 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. The amendment and terminal disclaimer filed April 25, 2003 have been received and entered.

Specification

2. The objection to the specification because of informalities at page 1 and page 5 of the specification, is withdrawn due to applicant's amendments to these pages.

Double Patenting

3. The provisional rejection of claims 14-23 and 25 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 21, 31, 40-46 and 49-52 of copending Application No. 09/914,656 is withdrawn due to applicant's filing of an acceptable terminal disclaimer. See the *Terminal Disclaimer* section below.

Terminal Disclaimer

4. The terminal disclaimer filed on April 25, 2003 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of that of 09/914,656 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 112

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5. The rejection of claims 14-26 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn due to applicant's amendments to claims 14 and 19.

Claim Objections

6. Claim 16 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim 14 as worded now requires "a plurality of drying units" to be controlled by the system. Claim 16 requires "at least two drying units". This would be encompassed by claim 14 as worded, which would require "at least two drying units" in order to have a plurality.

Claim Rejections - 35 USC § 102

7. The rejection of claims 14 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Fay et al (US 4087568) is withdrawn due to applicant's amendments to claim 14.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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A.

Claims 14-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fay as applied to claims 14-15 above, and further in view of WO 98/41805 (hereinafter '805).

Fay teaches a method for controlling drying effect of an equipment layout used in making a coated web. Figure 1 and column 2, lines 1-35. The coated web can be paper. Column 2, line 65 through column 3, line 5. The equipment layout includes a coater unit and a drying unit. Figure 1 and column 2, lines 55-65. A liquid containing coating is applied to a surface of the web. Figure 1 and column 2, line 55 through column 3, line 5. The coated web is dried in the drying unit by evaporating the liquid from the coated web until a moisture content of the web reaches a desired final moisture value. Figure 1 and column 2, lines 55-65 and column 3, lines 5-65. (note that the measured basis weight is directly based on the moisture content of the web). For the drying unit an evaporation/drying rate model is provided for computing the amount of liquid removed by the drying unit. Column 2, lines 55-65 and column 3, lines 5-65 (see the computation of % VA which is directly proportional to liquid removed, and note that drying rate would be equivalent to "evaporation rate" since the rates are based on liquid removed by heating). This is linked to/corresponds to the composite evaporation/drying rate model, because only one drying unit is provided, so the model for one is also the composite model for all. The needed evaporation/drying rate to be preformed by the equipment layout to achieve the desired final moisture value is determined. Column 2, lines 1-25. The needed evaporation/drying rate for the

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drying unit is also determined based on this determination of the equipment layout. The evaporation/drying rate is controlled based on the determined needed moisture evaporation effect.

Column 2, lines 1-25.

Claim 15: one drying unit is controlled with the composite evaporation rate model.

Column 2, lines 1-25 and column 3, lines 5-65. The claim does not actually require any other drying unit to be present.

Claim 17: Fay teaches a basis weight of the web attained after drying the web with the drying unit is measured. Figure 1 and column 3, lines 5-65 (note BW3). The final basis weight is a measure of the final moisture content as well. See column 3, lines 10-20. The measured basis weight is compared with the desired final basis weight. See the requirements of column 2, lines 1-25. The moisture evaporation rate for the drying unit is controlled with the composite evaporation rate model. See the requirements of column 2, lines 1-25,

Claim 18: Fay teaches that the basis weight is measured at at least one point upstream of where the final basis weight is measured to determine an intermediate basis weight value. Figure 1 and column 3, lines 5-65 (note BW2). The intermediate basis weight is a measure of the intermediate moisture content as well. See column 3, lines 10-15. The moisture evaporation rate for the drying unit is controlled, at least in part, by this measurement. See the requirements of column 2, lines 1-25.

Claim 19: Fay teaches that the the initial moisture content of the web can be measured prior to entering the first/only coater unit. See figure 1 and column 3, lines 55-65. The amount of liquid applied to the web in the applying step can be determined. See column 3, lines 5-65 (the

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measurement of the basis weight of the web before and after coating, and the computation of % VA). The evaporation rate of the drying unit is controlled based, at least in part, on the measured initial moisture content, the determined amount of liquid applied and the composite evaporation model. See column 3, lines 5-65.

Claim 20: Fay teaches that operating parameters of the drying unit are varied. See column 4, lines 5-10 and column 2, lines 1-25. A basis weight (proportional to moisture value) downstream of the drying unit is measured. Column 3, lines 5-65 (BW3). The measured value is compared to the value expected using the model. See the steps of column 8, claim 1. The evaporation rate of the drying unit is adjusted to provide a moisture value substantially the same as the desired/predicted value. See the steps of column 8, claim 1 and column 2, lines 1-25.

Claim 23: Fay teaches that any needed change in the overall moisture evaporation effect is allocated among the drying units. Column 2, lines 1-25 (since there is only one drying unit, all changes go that drying unit).

Fay teaches all the features of these claims except (1) the at least two drying units controlled by the composite model (claim 16), (2) using an output from one evaporation rate submodel of a drying unit as an input value to a next drying unit (claim 22), (3) using an output from one submodel as an input value for a preceding unit (claim 24, 25), (4) the use of subsystems each of a coater and dryer (claim 25, 26), (5) the specific moisture content measuring (claims 17-20) and (6) the stepwise control (claim 21).

However, '805 teaches that when coating a paper web, more than one dryer can be provided after the coater. Abstract and figure 1. The residual moisture of the web can be checked

at various points. Abstract and figure 1. One or more of the dryers can be adjusted to provide a web with the desired residual moisture. Abstract and figure 1.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fay to provide more than one dryer and control them using the composite model with subsystems as suggested by '805 with an expectation of desirable coating results, since Fay teaches coating and drying with control of the dryer to provide the desired moisture content in the web and '805 teaches that when coating and drying with multiple dryers the dryers can be controlled interdependently to provide the resulting desired moisture content. As to using the output from moisture content measurements in a feed forward or feed back pattern (claims 22, 24), it would have been obvious to provide adjustments in both directions so as to optimize the results in the quickest fashion, given the desire for efficiency and the continuous adjustments on the web shown by the references. As to the use of coating systems with multiple coater/dryer combinations, it would have been obvious to one of ordinary skill in the art to modify Fay in view of '805 to provide integrated control of such a system when providing more than one coating in series on a web, since Fay in view of '805 provides the suggestion of integrated control, and when providing a series of coatings on the web, with desired final moisture content, further control would be repetitive of what is taught by the combination of references. It would further have been obvious to one of ordinary skill in the art at the time the invention was made to modify Fay in view of '805 to specifically measure the moisture contents of the web and use that value for calculations with an expectation of desirable coating results, because Fay teaches to control the moisture content of the web through control of the residual volatiles in the dried web and further

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teaches the measurement of basis weight which is directly proportional to moisture weight of the web, and thus the use of moisture weight as the measurement would result in calculations directly proportional to those provided by Fay. It further would have been obvious to one of ordinary skill in the art to modify Fay in view of '805 to provide stepwise changes with an expectation of desirable coating results, because Fay specifically teaches a process based on controlling the drying unit based on measurements, and each new measurement would result in a specific individual recalculation and adjustment, which would provide stepwise control/adjustments.

Response to Arguments

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100 A. Applicant's arguments filed April 25, 2003 have been fully considered but they are not persuasive.

Applicant's Arguments

Applicant argues that in the present invention, a mathematical submodel is provided for every drying unit effecting the moisture content of the web. These submodels are then joined together to form a composite model that describes the wetting of the web and the evaporation over the whole production line. In the submodels, all process parameters are set as variables, and if one of the parameters changes, new values for every variable is calculated. Thus, the submodel calculates the moisture content of the web after a dryer automatically when a change in process occurs so that the moisture content after each dryer is known. No actual measurement of moisture content is needed. Applicant argues that Fay, on the other hand is directed only to a single coater and dryer and uses a normal closed loop control system wherein the drying effect of

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the dryer is adjusted in accordance with an actual moisture measurement after drying. Because Fay describes a process for controlling a single dryer, Fay does not disclose or suggest providing a drying model for a larger production line comprising several dryers as recited in the independent claim 14. Also, according to the invention recited in independent claim 14, the evaporation rate for each of the multiple dryers is calculated according to a mathematical model, not based upon and actual measurement of the web immediately after the particular dryer, as is done in Fay. Applicant further argues that dependent claims 15-26 are patentable for the same reasons that independent claim 14 is patentable.

The Examiner's Response

The Examiner has reviewed the above arguments, however, the rejection is maintained as in the 35 USC 103 rejection above. Applicant has argued that Fay is directed to a single dryer, and does not disclose or suggest a drying model for a multiple dryer system. The Examiner notes that this requirement of multiple dryers in claim 14 was added in the April 25, 2003 amendment. The Examiner has therefore adjusted the rejection to Fay in view of WO 98/41805 as was previously used for dependent claim 16 which requires at least two drying units. Applicant has argued that in the submodels of claim 14 are mathematical models that calculate the moisture content of the web automatically, and no actual measurement of the moisture content is need, and that Fay, on the other hand, requires actual measurements of moisture content. The Examiner notes however, that claim 14 does not prevent measuring the final moisture content as required by Fay, and further does not prevent measuring intermediate moisture content. The models as claimed do not prevent the input of measured data. The above rejection also provides a

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further discussion as to why the combination of Fay and '805 suggests various claimed features of the process and modeling system, and applicant has provided no arguments against the combination of Fay and '805 (as now provided for all claims, and in the last Office Action, for claims 16, 22 and 24-26).

Conclusion

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11 *AB* Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (703) 308-0078. The examiner can normally be reached on M-F(7:00-4:30) First Friday Off.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive P. Beck can be reached on (703) 308-2333. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


KATHERINE A. BAREFORD
PRIMARY EXAMINER
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